Part 2: Optional themes

Option A: Freshwater—issues and conflicts

This optional theme focuses on water on the land as a scarce resource. It considers the ways in which humans respond to the challenges of managing the quantity and quality of freshwater, as well as the consequences (whether intended or unintended, positive or negative) of management. The theme includes both the physical geography of freshwater (basic hydrology and floods) and human impacts on water quality.

This theme should include the study of **at least one** detailed case study at the drainage basin level. Reference should be made to additional examples, at a range of scales, in less depth, wherever appropriate.

Definitions

The definitions of the terms used in studying this theme, "Freshwater—issues and conflicts", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Drainage basin	The area drained by a river and its tributaries.
Drainage divide	Also known as a watershed, it is the line defining the boundary of a river or stream drainage basin separating it from adjacent basin(s).
Maximum sustainable yield	The maximum level of extraction of water that can be maintained indefinitely for a given area.
Wetlands	Areas that are regularly saturated by surface water or groundwater, including freshwater marshes, swamps and bogs.

Details

Sub-topic	Development	Teaching hours
1. The water system		
• The hydrological cycle	Examine the inputs, outputs, stores and transfers of the hydrological cycle. Discuss the causes and consequences of the changing balance between water stored in oceans and ice.	3 hours
• The water balance	Explain the concept of maximum sustainable yield of freshwater in terms of a balance between inputs and outputs.	

Sub-topic	Development	Teaching hours
2. Drainage basins and flooding		
• Drainage basins	Examine the functioning of a drainage basin as an open system with inputs, outputs, transfers, stores and feedback loops.	2 hours
• Discharge	Define stream discharge. Examine its relationship to stream flow and channel shape.	1 hour
• Hydrographs	Describe the characteristics of a hydrograph. Examine the reasons for spatial and temporal (short-term and long-term) variations in hydrographs. Examine the role of hydrographs in forecasting the magnitude, spatial extent and timing of floods.	3 hours
• Floods	Discuss the natural and human causes and consequences of a specific river flood.	3 hours
3. Management issues and strategies		
• Dams and reservoirs	Examine the hydrological changes resulting from the construction of dams and reservoirs. Examine the costs and benefits of dams and reservoirs as part of multi-purpose schemes.	2 hours
• Floodplain management	Explain the stream channel processes (erosion, transport, deposition) and explain the resultant landforms found on floodplains. Examine the human modifications of a floodplain and their effect on the size and probability of floods. Evaluate the costs and benefits of alternative stream management strategies.	3 hours
• Groundwater management	Explain the functioning and management of artesian basins and aquifers, distinguishing between natural and artificial recharge. Examine the environmental impacts of groundwater abstraction.	2 hours
• Freshwater wetland management	Describe the role of wetlands as a water resource. Evaluate the effectiveness of the management strategies that have been adopted in a major wetland.	2 hours
• Irrigation and agriculture	Examine the environmental impact of agriculture and irrigation on water quality: salinization, agro-chemical run-off, the pollution of groundwater and the eutrophication of lakes, rivers and wetlands.	3 hours

Sub-topic	Development	Teaching hours
4. Competing demands for water		
• Conflicts at the local or national scale	Examine the competing demands for water in a specific river basin. Evaluate the strategies that have been adopted to meet these demands.	6 hours
• Conflicts at the international scale	Discuss an example of an international conflict related to freshwater.	

Option B: Oceans and their coastal margins

Covering over 70% of the Earth's surface, oceans are of great importance to humans in a number of ways. This optional theme provides an introduction to the physical characteristics and processes of the oceans with particular reference to the atmosphere–ocean link, concentrating on the important role that oceans play in influencing climatic conditions. Issues arising from the oceans as resource bases are also considered.

The emphasis in the section on coastal margins is on management. Consequently, a detailed study of the physical characteristics and processes of coasts is not required, although some knowledge is essential for understanding management strategies.

The material has been organized in this theme to provide a sequenced structure for teaching. Attention is drawn to the need to provide detailed examples or case studies in several topics.

Definitions

The definitions of the terms used in studying this theme, "Oceans and their coastal margins", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Advancing coasts	Depositional coasts that are growing as a consequence of sediment deposit and/or the infill of coastal marshes. Advancing coasts may also arise from a negative change in sea level (sea level fall or uplift of land).
Exclusive economic zone (EEZ)	An area in which a coastal nation has sovereign rights over all the economic resources of the sea, seabed and subsoil, extending up to 200 nautical miles from the coast.
Littoral drift	The movement of sediment along a coast by wave action; also called longshore drift.
Oceanic conveyor belts	A global thermohaline circulation, driven by the formation and sinking of deep water and responsible for the large flow of upper ocean water.
Retreating coasts	Coasts along which the dominant processes are erosional, resulting in the coastline moving inland. Retreating coasts may also be caused by a positive change in sea level (sea level rise or a fall in land level).

Details

Sub-topic	Development	Teaching hours
1. Introduction to oceans		
• Distribution of oceans	Describe the distribution of oceans and ocean currents.	2 hours
• Morphology of oceans	Describe the main features of oceanic crust and ocean floor morphology. Explain the occurrence of oceanic volcanic features, trenches, transform faults, mid-ocean ridges and rifts in terms of plate margins.	
• Oceanic water	Describe the horizontal and vertical spatial variations in the temperature and salinity of ocean water.	
2. Oceans and climate		
• Energy transfers	Explain the thermal transfers of energy within oceans and the importance of oceanic conveyor belts.	4 hours
• El Niño Southern Oscillation (ENSO)	Explain the atmosphere–oceanic interactions associated with ENSO. Explain the El Niño and La Niña phenomena and their climatic, environmental and economic effects.	
• Carbon dioxide	Examine the role of oceans as a store and source of carbon dioxide (CO_2).	
3. The value of oceans		
• Resource base	Identify the biotic and abiotic resources of continental shelves, oceans and ocean floor deposits.	4 hours
• Fishing	Examine the spatial and temporal consequences of overfishing.	
• Case study	Evaluate a case study of a conservation policy implemented to provide sustainable fish yields. Describe the sources and distribution of pollution in the oceans.	
• Waste	Discuss the implications of the pollution of oceans by the disposal of radioactive material, oil and chemical waste.	3 hours
4. Geopolitics of oceans		
• Sovereignty rights	Discuss the sovereignty rights of nations in relation to territorial limits and exclusive economic zones (EEZ).	3 hours
• Conflict	Examine a geopolitical conflict in relation to an oceanic resource, other than fishing.	

Sub-topic	Development	Teaching hours
5. Coastal margins		
• Physical characteristics	Examine the relationship between coastal processes (tides, wave action, littoral drift, wind action), lithology, subaerial processes and different coastal landforms. Identify the major landforms of beaches, dunes and cliffs along advancing and retreating coasts.	4 hours
• Management strategies • Case study	Discuss the conflicts that arise from competing land uses and from attempts to manage coastal hazards (tsunamis and storm surges, erosion, cliff failure), pollution, habitat restoration and aquaculture. Describe the conflicting pressures on a particular coastline. Discuss the management strategies adopted to resolve these pressures and evaluate their effectiveness.	6 hours
6. Coral reefs and mangroves		
• Development • Causes and consequences	Examine the development and the environmental and economic value of coral reefs and mangrove swamps. Examine the causes and consequences of the loss of coral reefs and mangrove swamps.	4 hours

Option C: Extreme environments

This optional theme considers two different kinds of extreme environment.

- Cold and high-altitude environments (polar, glacial areas, periglacial areas, high mountains in non-tropical latitudes)
- Hot, arid environments (hot deserts and semi-arid areas)

These environments are relatively inaccessible and tend to be viewed as inhospitable to human habitation. Despite this, they provide numerous opportunities for settlement and economic activity. This theme examines the essential landscape characteristics of the two kinds of extreme environment, together with the natural processes operating in them, and the way in which people have responded to the opportunities they offer and the challenges they pose for management and sustainability.

While some parts of the theme focus on the global scale, other parts are best studied by the use of **one or more** localized case studies. It is expected that extensive use will be made of large-scale maps and visual material, since it is unlikely that most students will be personally familiar with more than one of these two kinds of extreme environment.

While the details below suggest one possible way of teaching the theme, other approaches are equally valid. Teachers may prefer to look first at all aspects of one kind of extreme environment and then examine the other kind of extreme environment.

Details

Sub-topic	Development	Teaching hours
1. Challenging environments		
• Global distribution of extreme environments	Explain the global distribution of each of the two kinds of extreme environment. Describe the relief and climatic characteristics that make these environments extreme. Explain how these characteristics present challenges for resource development and human habitation.	4 hours
• Population	Explain the other factors responsible for a low density of population in these areas: human discomfort, inaccessibility, remoteness. Identify ways in which people adapt their activities to extremes of weather and climate.	2 hours
2. The physical characteristics of extreme environments		
• Glacial environment	Explain the advance and retreat of glaciers and the main features resulting from the processes of erosion and deposition by glaciers.	3 hours
• Periglacial environment	Explain permafrost, patterned ground, solifluction, thermokarst, pingos.	3 hours
• Hot, arid environments (hot deserts and semi-arid areas)	Explain weathering and the processes involved in wind- and water-formed features. Explain the occurrence of flash floods.	4 hours
3. Opportunities and challenges for management		
• Agriculture	Hot, arid areas: examine the opportunities for agriculture in these areas, the distinction between aridity and infertility, the importance of irrigation and risk of salinization, and the processes and factors involved in desertification.	4 hours
• Mineral extraction	Periglacial areas: examine the opportunities and challenges posed by permafrost and other characteristics of periglacial areas for resource development (mineral extraction and any associated settlement and communications).	2 hours
	Hot, arid areas: examine the opportunities and challenges posed for resource development (mineral extraction and any associated settlement and communications).	2 hours

Sub-topic	Development	Teaching hours
• Tourism	Examine the opportunities and challenges posed by the development of tourism and any associated settlement and communications in one type of extreme environment. Examine the impacts of tourism on the environment, such as mass movements and erosion, land degradation, vulnerability to hazards, aesthetic change, water usage and waste disposal.	3 hours
4. Sustainability		
• Human activity • Impact	Discuss the degree to which human activities in extreme environments are unsustainable. Discuss the potential impact of global climatic change (global warming) on the indigenous populations, settlement and economic activities in extreme environments.	3 hours

Option D: Hazards and disasters—risk assessment and response

Environmental hazards exist at the interface between physical geography and human geography. Natural hazard events are often exacerbated by human actions, although conversely, human-induced hazard events are also affected by natural environmental conditions. The principles involved in studying natural hazards are identical to those involved in studying human-induced hazards.

The focus of this optional theme is on the full range of human adjustments and responses to hazards and disasters at a variety of scales. The term "natural disaster" is deliberately avoided in this theme because it is not considered to be an accurate reflection of the multitude of underlying reasons that expose people to risk and subsequently create the pre-conditions necessary for a disaster to occur.

In studying this theme, students are expected to examine the following **four** hazards.

- **Either** earthquakes **or** volcanoes
- Hurricanes (tropical cyclones, typhoons)
- Droughts
- Any one recent human-induced (technological) hazard resulting in an explosion or escape of hazardous material

These four hazards do not necessarily require an equal allocation of time; the precise balance will vary according to local preferences. The syllabus is designed to allow for flexibility but it is recommended that the overall approach should be concept by concept (such as vulnerability, risk and risk assessment), rather than entirely thematic (hazard by hazard). At least **one** case study of a hazard event (or disaster) is required for each of the four hazard types.

Definitions

The definitions of the terms used in studying this theme, "Hazards and disasters—risk assessment and response", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Disaster	A major hazard event that causes widespread disruption to a community or region that the affected community is unable to deal with adequately without outside help.
Hazard	A threat (whether natural or human) that has the potential to cause loss of life, injury, property damage, socio-economic disruption or environmental degradation.
Hazard event	The occurrence (realization) of a hazard, the effects of which change demographic, economic and/or environmental conditions.
Risk	The probability of a hazard event causing harmful consequences (expected losses in terms of deaths, injuries, property damage, economy and environment).
Vulnerability	The susceptibility of a community to a hazard or to the impacts of a hazard event.

Details

Sub-topic	Development	Teaching hours
1. Characteristics of hazards		
• Characteristics	Explain the characteristics and spatial distribution of the following hazards. • Either earthquakes or volcanoes • Hurricanes (tropical cyclones, typhoons) • Droughts • Any one recent human-induced (technological) hazard (explosion or escape of hazardous material) Distinguish between the chosen hazards in terms of their spatial extent, predictability, frequency, magnitude, duration, speed of onset and effects.	7 hours
2. Vulnerability		
• Vulnerable populations	Explain the reasons why people live in hazardous areas.	1 hour
• Vulnerability	Discuss vulnerability as a function of demographic and socio-economic factors, and of a community's preparedness and ability to deal with a hazard event when it occurs. Explain the reasons for some sectors of a population being more vulnerable than others.	3 hours

Sub-topic	Development	Teaching hours
3. Risk and risk assessment		
• Analysis of risk	Examine the relationships between the degree of risk posed by a hazard and the probability of a hazard event occurring, the predicted losses and a community's preparedness for it. Explain the reasons why individuals and communities often underestimate the probability of hazard events occurring. Discuss the factors that determine an individual's perception of the risk posed by hazards.	3 hours
• Hazard event prediction	Examine the methods used to make estimates (predictions) of the probability (in time and space) of hazard events occurring, and of their potential impact on lives and property. Discuss these methods by examining case studies relating to **two** different hazard types.	3 hours
4. Disasters		
• Definition • Measuring disasters	Distinguish between a hazard event and a disaster. Explain why this distinction is not always completely objective. Describe the methods used to quantify the spatial extent and intensity of disasters. Explain the causes and impacts of any **one** disaster resulting from a natural hazard. Explain the causes and impacts of any **one** recent human-induced hazard event or disaster. Examine the ways in which the intensity and impacts of disasters vary in space and have changed over time.	4 hours
5. Adjustments and responses to hazards and disasters		
• Responses to the risk of hazard events • Before the event	Discuss the usefulness of assessing risk before deciding the strategies of adjustment and response to a hazard. Describe attempts that have been made to reduce vulnerability by spreading the risk (aid, insurance) and by land-use planning (zoning). Describe strategies designed to limit the damage from potential hazard events and disasters.	4 hours

Sub-topic	Development	Teaching hours
• Short-term, mid-term and long-term responses after the event	Describe the range of responses, at the community, national and international levels, during and after a hazard event or disaster. Distinguish between rescue, rehabilitation and reconstruction responses. Explain how these responses are affected by individual and community perceptions. Examine the factors that affected the choice of adjustments before, and responses to, actual hazard events or disasters. Discuss the importance of re-assessing risk, and re-examining vulnerability, following any major hazard event or disaster.	5 hours

Option E: Leisure, sport and tourism

Leisure is defined for the purposes of this optional theme as any freely chosen activity or experience that takes place in non-work time.

The leisure industry is a significant and rapidly expanding global economic sector. This option is designed to illustrate the pattern and diversity of leisure activities, their increasing popularity and their impact on environments, culture and economy on a range of scales from global to local. Issues and conflicts arise for planners and managers in meeting leisure demand, conserving natural resources and avoiding social conflict.

The theme focuses specifically on **tourism**, **sport** and **recreation**. Although the three terms are defined separately, they overlap and participation in them may be simultaneous. For example, a sporting activity may occur during a vacation.

Definitions

The definitions of the terms used in studying this theme, "Leisure, sport and tourism", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Carrying capacity	The maximum number of visitors/participants that a site/event can satisfy at one time. It is customary to distinguish between **environmental carrying capacity** (the maximum number before the local environment becomes damaged) and **perceptual carrying capacity** (the maximum number before a specific group of visitors considers the level of impact, such as noise, to be excessive). For example, young mountain bikers may be more crowd-tolerant than elderly walkers.
Leisure	Any freely chosen activity or experience that takes place in non-work time.

Term	Definition
Primary tourist/ recreational resources	The pre-existing attractions for tourism or recreation (that is, those not built specifically for the purpose), including climate, scenery, wildlife, indigenous people, cultural and heritage sites. These are distinguished from **secondary tourist/recreational resources**, which include accommodation, catering, entertainment and shopping.
Recreation	A leisure-time activity undertaken voluntarily and for enjoyment. It includes individual pursuits, organized outings and events, and non-paid (non-professional) sports.
Resort	A settlement where the primary function is tourism. This includes a hotel complex.
Sport	A physical activity involving a set of rules or customs. The activity may be competitive.
Tourism	Travel away from home for at least one night for the purpose of leisure. Note that this definition excludes day-trippers. There are many possible subdivisions of tourism. Sub-groups include: • ecotourism—tourism focusing on the natural environment and local communities • heritage tourism—tourism based on a historic legacy (landscape feature, historic building or event) as its major attraction • sustainable tourism—tourism that conserves primary tourist resources and supports the livelihoods and culture of local people.

Details

Sub-topic	Development	Teaching hours
1. Leisure		
• Definitions	Discuss the difficulties in attempting to define leisure, recreation, tourism and sport. Discuss the influence of accessibility, changes in technology and affluence upon the growth of these activities.	2 hours
2. Leisure at the international scale: tourism		
• Changes in demand • Changes in supply	Explain the long- and short-term trends and patterns in international tourism. Examine the changes in location and development of different tourist activities. Explain the growth of more remote tourist destinations.	4 hours

Sub-topic	Development	Teaching hours
3. Leisure at the international scale: sport		
• International participation and success • Case study of a contemporary international sports event	Examine the social, cultural, economic and political factors affecting participation and success in two major international sports. Analyse the geographic factors that influenced the choice of venue(s). Examine the factors affecting the sphere of influence for participants and supporters. Evaluate the short- and long-term geographic costs and benefits of hosting such an event at both the local and national level.	4 hours
4. Leisure at the national/regional scale: tourism		
• Case study of a national tourist industry • Case study of ecotourism • Tourism as a development strategy	Examine the economic, social and environmental impacts of tourism. Evaluate the strategies designed to manage and sustain the tourist industry. Examine the importance of tourism as a development strategy for low-income countries.	6 hours
5. Leisure at the national/regional scale: sport		
• Case study of a national sports league	Explain the hierarchy of a league and the location of its teams. Examine the relationship between team location and the residence of its supporters.	3 hours
6. Leisure at the local scale: tourism		
• Tourism management in urban areas • Tourism management in rural areas	For **one** named city or large town: • describe the distribution and location of primary and secondary tourist resources • discuss the strategies designed to manage tourist demands, maximize capacity and minimize conflicts between local residents and visitors, and avoid environmental damage. Examine the concept of carrying capacities in a rural tourist area. Discuss strategies designed to maximize capacity and minimize conflicts between local residents and visitors, and avoid environmental damage.	4 hours

Sub-topic	Development	Teaching hours
7. Leisure at the local scale: sport and recreation		
• The leisure hierarchy	Explain the relationship between urban settlements and recreational and sports facilities in terms of frequency, size, range and catchment area.	4 hours
• Intra-urban spatial patterns	Examine the distribution and location of recreational and sports facilities in urban areas and relate the patterns to accessibility, land value and the physical and socio-economic characteristics of each urban zone (from the central business district to the rural–urban fringe).	
• Urban regeneration	Discuss the role of sport and recreation in regeneration strategies of urban areas.	
8. Sustainable tourism		
• Sustainable tourism	Define sustainable tourism. Examine the extent to which it might be successfully implemented in different environments.	3 hours

Option F: The geography of food and health

This optional theme is based on the underlying premise that the health of a population is the direct consequence of having enough food, a balanced diet and reduced susceptibility to disease. It covers a large area of knowledge, and time constraints mean that some parts may need to be covered in breadth rather than in depth.

The topic on health serves as an introduction to the theme, with more detailed coverage required for the remaining two topics on food and disease. These latter sections relate to some of the United Nations' Millennium Development Goals (MDGs), particularly those that challenge hunger and combat disease.

Detailed case studies are recommended, especially when impacts and evaluations are required. Case studies of **two** diseases are required, chosen from two **different** categories out of the following three: vector-borne, water-borne or sexually transmitted disease.

Definitions

The definitions of the terms used in studying this theme, "The geography of food and health", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Food miles	A measure of the distance that food travels from its source to the consumer. This can be given either in units of actual distance or of energy consumed during transport.
HALE	Health-adjusted life expectancy, based on life expectancy at birth but including an adjustment for time spent in poor health (due to disease and/or injury). It is the equivalent number of years in full health that a newborn can expect to live, based on current rates of ill health and mortality.
Transnational corporation (TNC)	A firm that owns or controls productive operations in more than one country through foreign direct investment.

Details

Sub-topic	Development	Teaching hours
1. Health		
• Variations in health	Describe the variations in health as reflected by changes in life expectancy at national and global scales since 1950. Explain the patterns and trends in terms of differences in income and lifestyle.	4 hours
• Measuring health	Evaluate life expectancy, infant mortality rate (IMR) and child mortality, HALE (health-adjusted life expectancy), calorie intake, access to safe water and access to health services as indicators of health.	
• Prevention relative to treatment	Discuss the geographic factors that determine the relative emphasis placed by policy-makers, in **one** country or region, on prevention as opposed to treatment of disease.	
2. Food		
• Global availability of food	Identify global patterns of calorie intake as one measure of food availability. Distinguish between malnutrition, temporary hunger, chronic hunger and famine. Discuss the concept of food security.	1 hour
• Areas of food sufficiency and deficiency	Explain how changes in agricultural systems, scientific and technological innovations, the expansion of the area under agriculture and the growth of agribusiness have increased the availability of food in some areas, starting with the Green Revolution and continuing since. Examine the environmental, demographic, political, social and economic factors that have caused areas of food deficiency and food insecurity.	3 hours

Sub-topic	Development	Teaching hours
• Case study	Examine the variety of causes responsible for a recent famine.	4 hours
• Production and markets	Examine the impacts at a variety of scales of trade barriers, agricultural subsidies, bilateral and multilateral agreements, and transnational corporations (TNCs) on the production and availability of food.	3 hours
• Addressing imbalances	Evaluate the relative importance of food aid, free trade and fair trade in alleviating food shortages.	3 hours
• Sustainable agriculture	Examine the concept of sustainable agriculture in terms of energy efficiency ratios and sustainable yields. Examine the concept of food miles as an indicator of environmental impact.	2 hours
3. Disease		
• Global patterns of disease	Explain the global distribution of diseases of affluence. Explain the global distribution of diseases of poverty.	2 hours
• The spread of disease	Explain how the geographic concepts of diffusion by relocation and by expansion apply to the spread of diseases. Examine the application of the concept of barriers in attempts to limit the spread of diseases. Describe the factors that have enabled reduction in incidence of a disease.	4 hours
• Geographic factors and impacts	Examine the geographic factors responsible for the incidence and spread of **two** diseases. Evaluate the geographic impact of these two diseases at the local, national and international scales. Evaluate the management strategies that have been applied in any one country or region for one of these diseases.	4 hours

Option G: Urban environments

This optional theme considers cities as places of intense social interaction and as focal points of production, wealth generation and consumption. They exhibit diversity in patterns of wealth and deprivation, which can result in conflict. Transport improvements have led to rapid growth and shifts in population and economic activities, producing stresses and challenges for planners.

The theme also considers issues of sustainability where the city is regarded as a system with inputs and outputs that need to be managed to minimize environmental impacts.

This theme recognizes that cities and towns may share common characteristics and processes irrespective of the national level of economic development.

For all sections of this optional theme (unless stated otherwise), **two** case studies of cities/large urban areas must be studied in **two** countries at contrasting levels of development.

Definitions

The definitions of the terms used in studying this theme, "Urban environments", vary from one source to another. To avoid confusion, the following definitions are given and expected of students.

Term	Definition
Brownfield site	Abandoned, derelict or under-used industrial buildings and land that may be contaminated but have potential for redevelopment.
Counter-urbanization	The movement of population away from inner urban areas to a new town, a new estate, a commuter town or a village on the edge or just beyond the city limits/rural–urban fringe.
Ecological footprint	The theoretical measurement of the amount of land and water a population requires to produce the resources it consumes and to absorb its waste under prevailing technology.
Re-urbanization	The development of activities to increase residential population densities within the existing built-up area of a city. This may include the redevelopment of vacant land, the refurbishment of housing and the development of new business enterprises.
Suburb	A residential area within or just outside the boundaries of a city.
Suburbanization	The outward growth of towns and cities to engulf surrounding villages and rural areas. This may result from the out-migration of population from the inner urban area to the suburbs or from inward rural–urban movement.
Sustainable urban management strategy	An approach to urban management that seeks to maintain and improve the quality of life for current and future urban dwellers. Aspects of management may be social (housing quality, crime), economic (jobs, income) or environmental (air, water, land, resources).
Urbanization	An increasing percentage of a country's population comes to live in towns and cities. It may involve both rural–urban migration and natural increase.
Urban sprawl	The unplanned and uncontrolled physical expansion of an urban area into the surrounding countryside. It is closely linked to the process of suburbanization.

Details

Sub-topic	Development	Teaching hours
1. Urban populations		
• Urbanization	Define urbanization and explain the variation in global growth rates and patterns.	2 hours
• Inward movement	Explain the processes of centripetal movements (rural–urban migration, gentrification, re-urbanization/urban renewal).	
• Outward movement	Explain the processes of centrifugal movements (suburbanization, counter-urbanization, urban sprawl).	
• Natural change	Explain the contribution of natural change to patterns of population density within urban areas.	
• The global megacity	Explain the global increase in the number and location of megacities (population over 10 million).	
2. Urban land use		
• Residential areas	Explain the location of residential areas in relation to wealth, ethnicity and family status (stage in life cycle). Examine patterns of urban poverty and deprivation (such as slums, squatter settlements, areas of low-cost housing and inner-city areas). Examine the causes and effects of the movement of socio-economic groups since the 1980s.	4 hours
• Areas of economic activity	Explain the spatial pattern of economic activity, the zoning of urban and suburban functions and the internal structure of the central business district (CBD). Describe the informal sector; its characteristics and location in urban areas. Examine the causes and effects of the movement of retailing, service and manufacturing activities to new locations, including brownfield sites.	4 hours
3. Urban stress		
• Urban microclimate	Examine the effects of structures and human activity on urban microclimates, including the urban heat island effect and air pollution.	4 hours
• Other types of environmental and social stress	Examine the other symptoms of urban stress including congestion, overcrowding and noise, depletion of green space, waste overburden, poor quality housing, social deprivation, crime and inequality.	4 hours

Sub-topic	Development	Teaching hours
4. The sustainable city		
• The city as a system	Describe the city as a system in terms of: • inputs—energy, water, people, materials, products, food (urban agriculture) • outputs—solid, atmospheric and liquid waste, noise, people. Distinguish between a sustainable circular system where inputs are reduced and outputs are recycled and an unsustainable (open/linear) city system with uncontrolled inputs and outputs.	2 hours
• Case studies	Referring to at least **two** city case studies, discuss the concepts of: • sustainable city management • the urban ecological footprint.	4 hours
• Sustainable strategies	Evaluate **one** case study of **each** of the following. • One socially sustainable housing management strategy. • One environmentally sustainable pollution management strategy. • One strategy to control rapid city growth resulting from in-migration.	6 hours